

AMENDMENTS TO THE CLAIMS

1. (Canceled)

2. (Canceled)

3. (Currently Amended) A ~~The~~ method of ~~claim 1~~
~~wherein scheduling connections for a network processor~~
comprising:

in a cache memory, scheduling a plurality of
connections to be serviced based on quality of service
parameters stored in a control structure corresponding to each
connection includes:

receiving data from a first connection;

determining whether an entry for a control
structure corresponding to the first connection is included in
one of the cache memory and an external memory;

accessing one or more portions of the
control structure;

calculating a service time when the first
connection is to be serviced, the service time being based on
the quality of service parameters;

determining whether to schedule the first
connection to be serviced in one of the cache memory and a
calendar based on the service time; and

if it is determined to schedule the first
connection in the cache memory, in the cache memory,
scheduling the first connection to be serviced based on

quality of service parameters stored in the control structure corresponding to the first connection [.] ; and

during a scheduling opportunity:

identifying one or more of the plurality of connections in the cache memory to be serviced;

selecting one of the connections identified to be serviced;

servicing the selected connection;

accessing one or more portions of the control structure, including the quality of service parameters, in the cache memory, the quality of service parameters corresponding to the selected connection;

calculating a next service time when the selected connection is to be serviced, the next service time being based on the quality of service parameters; and

determining whether to schedule the selected connection to be serviced in one of the cache memory and a calendar based on the next service time.

4. (Canceled)

5. (Canceled)

6. (Currently Amended) ~~The~~ A method of claim 5 further comprising scheduling connections for a network processor comprising:

in a cache memory, scheduling a plurality of connections to be serviced based on quality of service

parameters stored in a control structure corresponding to each connection; and

during a scheduling opportunity:

identifying one or more of the plurality of connections in the cache memory to be serviced including employing a key to identify one or more of the plurality of connections in the cache memory that include a service time that matches the key, the service time being based on the quality of service parameters;

selecting one of the connections identified to be serviced;

servicing the selected connection;

accessing one or more portions of the control structure, including the quality of service parameters, in the cache memory, the quality of service parameters corresponding to the selected connection;

calculating a next service time when the selected connection is to be serviced, the next service time being based on the quality of service parameters;

determining whether to schedule the selected connection to be serviced in one of the cache memory and a calendar based on the next service time; and

scheduling the selected connection to be serviced in the cache memory when a difference between the next service time and the key is approximately less than a predetermined number of scheduling opportunities.

7. (Currently Amended) ~~The~~ A method of claim
~~5 further comprising~~ scheduling connections for a network
processor comprising:

in a cache memory, scheduling a plurality of
connections to be serviced based on quality of service
parameters stored in a control structure corresponding to each
connection; and

during a scheduling opportunity:

identifying one or more of the plurality
of connections in the cache memory to be serviced including
employing a key to identify one or more of the plurality of
connections in the cache memory that include a service time
that matches the key, the service time being based on the
quality of service parameters;

selecting one of the connections
identified to be serviced;

servicing the selected connection;

accessing one or more portions of the
control structure, including the quality of service
parameters, in the cache memory, the quality of service
parameters corresponding to the selected connection;

calculating a next service time when the
selected connection is to be serviced, the next service time
being based on the quality of service parameters;

determining whether to schedule the
selected connection to be serviced in one of the cache memory
and a calendar based on the next service time; and

scheduling the selected connection to be serviced in the calendar when the difference between the next service time and the key is approximately greater or equal to than a predetermined number of scheduling opportunities.

8. (Canceled)

9. (Canceled)

10. (Canceled)

11. (Canceled)

12. (Currently Amended) ~~An The apparatus of claim~~
10 for scheduling connections for a network processor
comprising:

an external memory; and
scheduler logic, having a cache memory and a
calendar, coupled to the external memory, and adapted to:
in the cache memory, schedule a plurality
of connections to be serviced based on quality of service
parameters stored in a control structure corresponding to each
connection;

during a scheduling opportunity:
identify one or more of the plurality
of connections in the cache memory to be serviced;
select one of the connections
identified to be serviced;

service the selected connection;
access one or more portions of the
control structure, including the quality of service
parameters, in the cache memory, the quality of service
parameters corresponding to the selected connection;
calculate a next service time when
the selected connection is to be serviced, the next service
time being based on the quality of service parameters; and
determine whether to schedule the
selected connection to be serviced in one of the cache memory
and the calendar based on the next service time; and

wherein the scheduler logic is further
adapted to:

receive data from a first connection;
determine whether an entry for a
control structure corresponding to the first connection is
included in one of the cache memory and the external memory;
access one or more portions of the
control structure;

calculate a service time when the
first connection is to be serviced, the service time being
based on the quality of service parameters;

determine whether to schedule the
first connection to be serviced, in one of the cache memory
and the calendar based on the service time; and

if it is determined to schedule the
first connection in the cache memory, in the cache memory,
schedule the first connection to be serviced based on quality

of service parameters stored in the control structure corresponding to the first connection.

13. (Canceled)

14. (Canceled)

15. (Currently Amended) ~~The~~ An apparatus of claim ~~14~~ for scheduling connections for a network processor comprising:

an external memory; and
scheduler logic, having a cache memory and a
calendar, coupled to the external memory, and adapted to:
in the cache memory, schedule a plurality
of connections to be serviced based on quality of service
parameters stored in a control structure corresponding to each
connection;

during a scheduling opportunity:
identify one or more of the plurality
of connections in the cache memory to be serviced;
select one of the connections
identified to be serviced;
service the selected connection;
access one or more portions of the
control structure, including the quality of service
parameters, in the cache memory, the quality of service
parameters corresponding to the selected connection;

calculate a next service time when the selected connection is to be serviced, the next service time being based on the quality of service parameters; and
determine whether to schedule the selected connection to be serviced in one of the cache memory and the calendar based on the next service time;

employ a key to identify one or more of the plurality of connections in the cache memory that include a service time that matches the key, the service time being based on the quality of service parameters; and

wherein the scheduler logic is further adapted to schedule the selected connection to be serviced in the cache memory when a difference between a next service time and the key time is approximately less than a predetermined number of scheduling opportunities.

16. (Currently Amended) ~~The~~ An apparatus of claim 14 for scheduling connections for a network processor comprising:

an external memory; and
scheduler logic, having a cache memory and a calendar, coupled to the external memory, and adapted to:
in the cache memory, schedule a plurality of connections to be serviced based on quality of service parameters stored in a control structure corresponding to each connection;

during a scheduling opportunity:

identify one or more of the plurality
of connections in the cache memory to be serviced;

select one of the connections
identified to be serviced;

service the selected connection;
access one or more portions of the
control structure, including the quality of service
parameters, in the cache memory, the quality of service
parameters corresponding to the selected connection;

calculate a next service time when
the selected connection is to be serviced, the next service
time being based on the quality of service parameters; and

determine whether to schedule the
selected connection to be serviced in one of the cache memory
and the calendar based on the next service time;

employ a key to identify one or more of
the plurality of connections in the cache memory that include
a service time that matches the key, the service time being
based on the quality of service parameters; and

wherein the scheduler logic is further
adapted to schedule the selected connection to be serviced in
the calendar when a difference between a next service time and
the key is approximately greater than or equal to a
predetermined number of scheduling opportunities.

17. (Canceled)

18. (Canceled)

19. (Currently Amended) ~~The~~ An apparatus of claim
10 for scheduling connections for a network processor
comprising:

an external memory; and
scheduler logic, having a cache memory and a
calendar, coupled to the external memory, and adapted to:
in the cache memory, schedule a plurality
of connections to be serviced based on quality of service
parameters stored in a control structure corresponding to each
connection; and

during a scheduling opportunity:
identify one or more of the plurality
of connections in the cache memory to be serviced;

select one of the connections
identified to be serviced;

service the selected connection;
access one or more portions of the
control structure, including the quality of service
parameters, in the cache memory, the quality of service
parameters corresponding to the selected connection;

calculate a next service time when
the selected connection is to be serviced, the next service
time being based on the quality of service parameters; and

determine whether to schedule the
selected connection to be serviced in one of the cache memory
and the calendar based on the next service time; and

wherein the scheduler logic comprises:

reload control logic coupled to the cache memory, reload calendar, external memory, and evict control logic, and adapted to:

schedule one or more portions of a control structure corresponding to a connection to be serviced in the reload calendar;

retrieve one or more portions of the control structure corresponding to the connection to be serviced from the reload calendar; and

schedule the one or more portions of the retrieved control structure corresponding to a connection to be serviced in the cache memory;

enqueue control logic coupled to the cache memory, and the external memory, and adapted to schedule one or more portions of the control structure corresponding to the connection to be serviced in the cache memory;

dequeue control logic coupled to the cache memory, and adapted to:

identify one or more of a plurality of connections in the cache memory to be serviced;

select one of the connections identified to be serviced; and

service the selected connection;
and

evict control logic coupled to the cache memory and the external memory, and adapted to:

receive one or more portions of the control structure corresponding to the connection that was scheduled in the cache memory; and

determine whether to output the one or more portions of the control structure to one of the external memory and the reload control logic.

20. (Original) The apparatus of claim 19 wherein the cache memory includes:

a time stamp contents addressable memory;
a flow id contents addressable memory; and
a flow control block memory;

wherein the time stamp contents addressable memory, flow id contents addressable memory and the flow control block memory are such adapted to store one or more portions of each cache memory entry.

21. (Canceled)

22. (Canceled)